



Mangosteen Research

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Characteristics of Mangosteen

The Mangosteen is a tropical evergreen tree native to Southeast Asia, highly valued for its prized fruit. Known by its scientific name, *Garcinia mangostana*, it is famously referred to as the "Queen of Fruits" due to its delicate and delicious flavor. The tree itself can grow to a height of 20 to 80 feet and has a naturally rounded or pyramidal shape. It is a tropical fruit native to Southeast Asia with a thick, deep purple rind and soft, sweet, juicy white flesh. It has a flavor profile that is both sweet and tangy with notes of peach, pineapple, and citrus.

Use of Mangosteen in Food

Mangosteen is usually eaten fresh, but it can also be used in sweet and savory dishes, drinks, and desserts because of its sweet-tart, floral flavor.

1. Fresh / Raw

- **Fruit platters** – eat the arils fresh, chilled, or mixed with tropical fruits like pineapple, mango, and papaya.
- **Salads** – add mangosteen segments to green salads or Thai-style fruit salads for sweetness and acidity.



2. Drinks

- **Juice / Smoothies** – blend mangosteen flesh with water, ice, or coconut water.
- **Cocktails / Mocktails** – muddle mangosteen arils into mojitos, gin-based cocktails, or sparkling soda drinks.
- **Tea** – mangosteen rind (pericarp) is sometimes dried and infused as herbal tea.

3. Desserts

- **Sorbet / Ice cream** – puree mangosteen with sugar and freeze.
- **Cakes / Pastries** – use as topping or filling.
- **Jams & preserves** – cook mangosteen with sugar into a tropical jam.

4. Savory Cooking

- **Thai & Filipino dishes** – in Mindanao and Southeast Asia, mangosteen can be added to sour soups (similar to sinigang) for flavor.

- **Chutneys & sauces** – simmer mangosteen with vinegar, chili, and spices for a sweet-sour dip for meats or fish.
- **Seafood pairings** – its acidity balances rich, oily fish (like mackerel) or shellfish.

Nutritional Profile

Mangosteen are a nutritious fruit, providing a good source of fiber, vitamins, and minerals. One cup of canned, drained Mangosteen contains:

- Calories: 143
- Fiber: 3.5 g
- Manganese: 0.2 mg
- Copper: 0.135 mcg
- Folate: 61 mcg
- Vitamin C: 5.68 mg

Health Benefits

In addition to its vitamins and minerals, Mangosteen contains plant compounds called xanthones, which offer antioxidant and anti-inflammatory properties.

- **Rich in antioxidants:** Mangosteen's antioxidant compounds, including xanthones, help to neutralize free radicals, which are unstable molecules that can damage cells and contribute to chronic disease.
- **Immune system support:** The fruit contains both fiber and vitamin C, which are known to support a healthy immune system.
- **Potential anti-inflammatory effects:** Some research suggests mangosteen may help reduce inflammation. One small study found that people who drank a mangosteen-based beverage had a 46% reduction in a key inflammation marker.
- **Promotes digestive health:** Mangosteen is a good source of fiber, which helps promote healthy gut bacteria and regularity.

Potential risks

While Mangosteen is generally safe to eat, some precautions are advised:

- **Medication interaction:** Mangosteen may interfere with blood-clotting medications and some cancer treatments. It is recommended to consult a doctor before consuming Mangosteen supplements, particularly if you have a bleeding disorder or are undergoing chemotherapy.



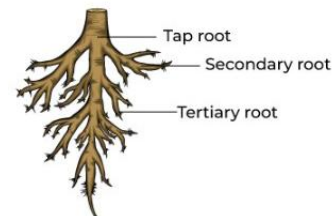
- **High sugar content:** The fruit contains a high amount of natural sugars, so it should be consumed in moderation, especially by individuals with diabetes.
- **Case reports of lactic acidosis:** A single case of severe lactic acidosis was reported in a person who consumed Mangosteen juice daily for 12 months. However, the overall risk is unknown.

Root system

The Mangosteen tree (*Garcinia mangostana*) has a weak and sensitive root system composed of a long, delicate taproot and poor lateral root branching. This makes the tree particularly vulnerable to drought and makes it difficult to transplant.

Key characteristics of the root system

1. **Long taproot:** The seedlings first develop a long, fragile taproot that grows deep into the soil. This taproot can be even longer than the above-ground seedling in the first couple of years.
2. **Poor branching:** In contrast to its long taproot, the Mangosteen root system has poor lateral (side) branching and lacks root hairs. Root hairs significantly increase the surface area for absorbing water and nutrients, so their absence contributes to the plant's sensitivity to water availability.
3. **Sensitivity to disturbance:** Due to the fragile nature of its taproot, the Mangosteen seedling is very sensitive to being moved or transplanted. Transplanting should be done with care, ideally when the plant is very young, to minimize root disturbance and shock. Growers often start seedlings in deep containers to accommodate the long taproot.
4. **Adaptations for saturated soil:** While preferring well-drained, deep soil, Mangosteen trees on Bengkalis Island in Indonesia have been found to develop aerenchyma, air channels in their roots, as an adaptation to tolerate flooded conditions. Mangosteen trees in non-flooded areas generally lack this adaptation.
5. **Slow growth:** The weak root system, including the lack of root hairs, is one of the main reasons for the Mangosteen tree's notoriously slow growth rate. This restricts the efficient uptake of water and nutrients, contributing to its long juvenile period before fruiting.



Dicot Root
Tap Root

Types of Root



General Root Characteristics

- Mangosteen trees have a deep root system that typically extends **2 to 3 feet** (about 60 to 90 cm) into the soil.
- The roots can spread horizontally as well, often reaching out 3 to 5 feet (about 90 to 150 cm) from the trunk.
- Factors Influencing Root Depth
- Soil Type: In well-drained, rich soils, roots may grow deeper compared to compact or rocky soils.
- Water Availability: Adequate moisture encourages deeper root growth, while dry conditions may limit depth.
- Tree Age: Younger trees may have shallower roots, while mature trees develop deeper and more extensive root systems.

Considerations for Planting

When planting Mangosteen, ensure the hole is at least 30 inches wide and deep to accommodate root growth. **Avoid planting in areas with hard, compacted soil, as this can hinder root development.** Understanding these aspects can help in successfully cultivating Mangosteen trees.

Growth, Flowering, and Fruiting

Notes: Mangosteen is slow to mature relative to many tropical fruits. Times below are typical ranges; localized management (grafting, good nutrition, off-season forcing) can shorten times.

Characteristic	Typical range (seedling trees)	Grafted/clonal	Market/size notes
Time to first flowering	4–8 years (commonly 5–8 yrs). Développement Durable	3–5 years (grafted, well-managed) — can be earlier in good nurseries. Padmam Nursery	Early flowering improves cashflow but depends on rootstock & care.
Time to first commercial fruiting / steady production	6–10 years (stable mature yields around this age). Internet Archive	4–7 years typical under good graft/clonal programs. Padmam Nursery	Many Philippine extension reports cite productive orchards by year 5–8 under good management. High Value Crops Program
Growth rate (height)	Slow–moderate. Trees may reach 6–20 m over many years; growers prune for canopy control. Développement Durable	Similar maximum height, but earlier crown development on grafts.	Pruning recommended for manageability.
Fruit size (grams)	Small to medium: common 50–120 g per fruit; seedling variation exists (some entries report averages ~60–100 g). UKDR UPLB+1	Clonal selections can produce larger, more consistent fruit (nursery claims vary). Padmam Nursery	



Root system & growing implications

- **Root system:** Mangosteen has a **sensitive, fairly shallow root system** with a brittle taproot when young; roots are sensitive to disturbance and to waterlogging. Transplanting must be handled carefully. The tree prefers **deep, fertile, well-drained soils with good organic matter** and consistent moisture (humid tropics). Avoid heavy waterlogging and very shallow soils. [ARS+1](#)
- **Growing implications:**
- Avoid low terraces or sites with persistent waterlogging. Improve soil organic matter and drainage.
- Young trees benefit from partial shade and wind shelter.
- Planting while root system still small (potted/grafted) and careful handling increases survival. High Value Crops Program+1

Sun Requirements

Mangosteen thrives in **partial sun** conditions, especially during its early years. Young trees prefer **filtered light or gentle morning sun**, which protects their tender leaves from scorching. As they mature, they can accept more light, but still perform best with moderated exposure rather than full, intense sunlight.

Shade Tolerance

Mangosteen has **high shade tolerance**, especially in its juvenile stage. It naturally grows under the canopy of taller trees and benefits from **40–60% shade** during establishment. Mature trees can handle reduced shade but still struggle under full, harsh sun. Consistent light shade keeps stress low, improves leaf health, and supports steady growth and fruiting.

Varieties of Mongosteen

- **Seedling selections (local)** — many unnamed seedling types; variable fruit size and yield. Some selected seedling clones with local names exist. [Développement Durable](#)
- **Roxas Purple** — NSIC-registered local selection; small/oblong fruits avg ~65 g, early fruiting in some localities (reported fruiting July–Aug in some areas). Good yield data reported in UPLB notes. [UKDR UPLB](#)
- **Grafted trees & hybrids:** Grafting onto compatible *Garcinia* rootstocks (including some hybrids such as ***Garcinia xanthochymus*** as rootstock) is used to accelerate bearing and manage root traits; grafted plants and clonal selections shorten time to fruiting and keep desirable fruit quality. Commercial grafted plants are available from nurseries and sometimes command higher prices. However,



truly named, widely-commercial clonal “varieties” are fewer than for mango/durian — most improvement is by selection and local clones.

tropicalfruitforum.com+1

Takeaway: Expect mostly seedling stock unless you intentionally buy grafted/clonal material; grafted/clonal trees bear earlier and more uniformly.

Intercropping Table (Jessie's Sunshine Farm)

Tree / Crop	Sun Requirement	Shade Tolerance	Spacing	Intercropping Suitability & Notes
Mango (Mangga Cebu / Carabao)	Full sun (8–10 hrs)	Low	8–10 m	Good with coconuts, limes, lemons, Santol. Do not plant under shade trees. Keep mango as upper canopy.
Mangosteen	Partial sun, filtered	High	7–9 m	Excellent under coconuts or tall mango trees. Avoid full sun exposure. Best as an understory crop.
Rambutan	Full sun to light partial	Medium	8–10 m	Can grow with coconuts and Santol. Avoid too much shade; keep spacing wide for airflow.
Bangkok Santol	Full sun	Medium	8–10 m	Works with coconuts, Rambutan, mango. Can give partial shade to Mangosteen. Large canopy—maintain pruning.
Tabon-Tabon	Partial sun	Medium–High	6–8 m	Good under coconuts or light canopy. Avoid full sun in early years. Pairs well with Mangosteen as mid-shade crop.
American Lime / Persian Lime	Full sun	Low–Medium	4–6 m	Good intercrop with coconuts due to small canopy. Avoid planting under heavy shade from mango or Santol.
Lemon (American Lemon)	Full sun	Low–Medium	4–6 m	Works well under coconuts or beside limes. Avoid shade from tall fruit trees.
Coconut	Full sun	Low	8–10 m	Excellent intercrop layer. Canopies allow filtered light—ideal for Mangosteen, tabon-tabon, Rambutan, citrus underneath.

Commercial Feasibility Summary — Mangosteen

Mangosteen presents a **high-value, long-term investment crop** for Jessie's Sunshine Farm, especially when integrated into the existing multistory fruit system with coconuts, santol, mango, and other value trees. The farm's elevation, fertile soils, and reliable rainfall pattern in Southern Bukidnon—including the strong marketing hub of Valencia—provide a **favorable environment** for establishing mangosteen as a premium specialty fruit. Although the crop has a slow establishment phase (6–8 years before notable yields), its **high market price**, year-round demand, and limited local supply make it commercially attractive once production begins.

Intercropping significantly boosts feasibility: mangosteen thrives under **filtered shade**, making it ideal for planting beneath coconuts or beside tall santol or mango trees. This reduces land-cost per crop, spreads risk, and minimizes sun-stress losses. Operationally, mangosteen requires consistent moisture, organic matter, and protection from harsh sun, but once mature, trees are long-lived and provide stable yields for decades. The labor requirement is moderate, mainly focused on pruning for airflow and careful harvesting to avoid fruit damage.



On the market side, Jessie's Sunshine Farm benefits from proximity to **Valencia City**, a strong buyer hub with fruit retailers, organic shops, and hotel-resto markets. Local supply remains insufficient, so farms delivering clean, uniform, high-grade mangosteen can command premium pricing and advance orders. There is also potential for **value-added expansion**—dried rind tea, antioxidant powder, and premium boxed fruit for urban markets.

Overall, mangosteen offers **excellent long-term profitability, strong market fit, and good synergy with the farm's current intercropping strategy**. While it requires patience during establishment, its premium price, low competition, and suitability for shaded, multistory systems make it a strategically sound crop for Jessie's Sunshine Farm's long-term diversification and value expansion.

Market Demand & Acceptance

Mangosteen enjoys **strong niche demand** across Southern Bukidnon, especially in Valencia where urban markets are expanding and consumers prefer premium, antioxidant-rich fruits. Although local supply is limited, demand remains consistently high due to mangosteen's reputation as a "super fruit." Buyers often pay **premium farm-gate prices**, and hotels, fruit stands, and resellers readily accept clean, uniform, pesticide-safe fruits. Demand peaks during harvest season but remains steady year-round because supply is chronically insufficient.

Market Acceptance is high for clean purple rind, intact calyx, and white juicy arils; premium if off-season or export standard quality. Widely accepted domestically and exported. Consumers prefer clean, plump, well-colored fruits with intact calyx and good white segments. Export markets (where accessible) pay premiums for consistent size and post-harvest handling. Domestic wholesale/farmgate demand in Mindanao is steady during season; off-season supply (with technology) can fetch premium prices. [Tridge+1](#)

Risks & Challenges

Mangosteen has **slow early growth**, requiring 6–8 years before meaningful production, which delays ROI. It is also highly sensitive to drought, full sun exposure, and poor soil moisture—conditions that can occur in upland zones of Southern Bukidnon during dry months. High humidity and poor airflow can also encourage fungal issues. Market-wise, competition from cheaper imported fruits during off-season can temporarily affect prices. Transport is delicate; fruits bruise easily, reducing market grade.



Opportunities

Southern Bukidnon's fertile soils, abundant rainfall, and cooler elevations offer **ideal microclimates** for Mangosteen, especially in shaded or coconut-based systems. With growing health-conscious consumers in Valencia and nearby cities, premium and organic Mangosteen attracts excellent pricing. Intercropping with coconuts, Santol, or tall mango trees reduces risk and improves land efficiency. There is strong potential for **value-added products** such as Mangosteen capsules, rind tea, puree, and fresh boxed premium fruits for regional distribution.

Summary for Southern Bukidnon & Valencia

Mangosteen is a **high-value but slow-maturing crop** that fits well with the region's natural rainfall and shaded farm systems. In Valencia, where market access is strong, demand significantly exceeds local production, offering excellent long-term profitability for farms willing to manage the long establishment period. With proper shade, moisture management, and mixed-canopy planting (especially with coconuts), mangosteen can become a stable, premium specialty fruit for Jessie's Sunshine Farm and the wider Bukidnon market.